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PHOSPHATE MINING ON THE WEST COAST OF FLORIDA.

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THE GEOGRAPHY OF THE SOUTHERN PENINSULA OF THE UNITED STATES

By The Rev. JAMES N. MACGONIGLE

The study of the geography of the southern peninsula of the United States began about 400 years ago. Although the Great Admiral had not found the mainland of the Western Hemisphere, he had planted the standard of Spain on its adjacent islands, and his reports had kindled the spirit of adventure and awakened the hope of greater discoveries. In 1498 an expedition led by Pinzon and Solis entered the gulf of Mexico and made the harbor of Tampico, sailing thence around the whole of the Gulf coast, circumnavigating the southern peninsula, and journeying northward as far perhaps as the capes of Chesapeake bay. Of this successful voyage Landseum and Amerigo Vesputius were the pilots, and it was doubtless from their charts that the first map of the peninsula was made. This map was made in Portugal, by some one unknown, for Alberto Cantino, who carried it to Italy to the Duke of Ferrara in the autumn of 1502. The original map now lies in Modena, where it has been since 1858. One recognizes at a glance its singular correctness, at least as to its general outlines. It shows the deep indentations of the west coast and hints at the characteristic lagoon on the east. Without much difficulty and with reasonable certainty we can make some identifications. The River of the Palma is the Apalachicola, the Cape of the End of April is the southern point of the peninsula, the River of the Canoes is the Matanzas, and the River of the Alligators the St. Johns. Both this and the *Tabula Terre Novæ* of 1508 were supposed to exhibit the new world, and therefore to include in Florida the

whole of North America. How widely they were published we do not know, but they doubtless aided greatly in the conduct of subsequent expeditions.

Added to the other impulses toward discovery which marked the twilight of the fifteenth century, the love of life contributed its strong motives. In a book which might have been dedicated to Anaxias, John Mandeville told of a fountain in eastern Asia of which he and his fellow-travelers had drunk freely, and ever since had known new life, instinct with the strength and joy of youth. To find this fountain of youth became a new quest of the voyager. From Porto Rico, in the island of Hispaniola, Juan Ponce de Leon set sail in March, 1512. From the folklore of the natives of Hispaniola he had learned that the fabled fountain would be found in Bimini, a little island of the Bahamas group. He had authority from the king to conquer Bimini. His course, however, led him too far to the westward, and on March 27 the white sands of the southern peninsula came in sight. It was Pascua Florida, or Easter Sunday, and the new land was named Florida. Term Florida it has been ever since, not only because Ponce de Leon reached it on Pascua Florida, but because it is a land of flowers. On April 2 Ponce de Leon landed at about 30° N., but sailed away again immediately, making his way around the peninsula to latitude $27^{\circ} 30'$, whence he sailed home. In 1521 he returned to colonize his territory. The Indians met him with savage resistance, and instead of the fountain of perpetual youth he found defeat, receiving an arrow wound which resulted in a lingering illness and his death in Cuba.

The portion of the state of Florida to be considered in this article lies between longitude 8° and $6^{\circ} 30'$ west of Washington and between $24^{\circ} 30'$ and 30° N. latitude. It has the Atlantic ocean on the east, the gulf of Mexico on the west, and the strait of Florida on the south. Close to its eastern shore is the Gulf stream, in many places not more than two miles distant.

The geology of Florida presents no grave or complicated problems. Lying immediately beneath the surface is a limestone which persists through the entire length of the state. This doubtless belongs to the Eocene system. The limestone, which forms the crest of a fold known as "the ridge," is very permeable by water. It is characterized by enormous sink-holes and subterranean streams. It forms the beds of the middle rivers and of the countless lakes. Lying to the west of this limestone ridge are those marvelous deposits of phosphates which are found

along the west coast of the peninsula. East of the ridge, and more especially where it approaches the Atlantic, we find the coquina beds of sand and shells, which, with varying structure, form the barrier between the sea and the great coastal lagoon.

The peninsula naturally separates into three divisions; the middle portion, which comprises the beautiful lake region; the west coast, which slopes away from the high ridge to the gulf of Mexico, and the east coast, whose sandy levels are protected from the Atlantic by the great coquina wall, extending from the mouth of the St. Johns river to the shores of lake Worth. Each of these divisions differs wholly from the others, presenting conditions and characteristics peculiar to itself.

Middle Florida is a broad ridge which reaches at places an elevation of nearly 250 feet. The soil is for the most part sandy, but like that of the state in general, it contains a sufficient quantity of phosphate to render it fertile. Forests of pine are everywhere. Here and there a cypress swamp varies the scene, and now and then a palmetto hammock suggests the approach of the tropics. It is in this division the lake region is found. Dotting the landscape like jewels of crystal in a field of green are numberless lakes, varying in size from a gem-like lakelet to the broad expanse of Okeechobee. Within a radius of 5 miles from Winter Haven 100 have been counted, and within 7 miles of Orlando there are known to be 150. With Gainesville as its northern limit and including lake Okeechobee on the south, this region contains at a conservative estimate at least 30,000 of these lakes and lakelets. They are not, as many imagine, the result of surface drainage or the reservoirs of sluggish streams. Many of them find their chief supply in the hidden sources of the great limestone which forms their beds, and some of them are connected by subterranean channels. It has frequently been observed that the fall of one means the rise of another. In some cases the water has disappeared entirely for a long period, only to return again, sometimes quite unexpectedly. Their waters are pure and they abound in fish. Clustered around them are the homes of thousands of people who have been driven south by disease of the throat and lungs. The pine forests, the dry soil, the elevation above the not distant coast, the soft air and the healing sunshine insure almost entire immunity from pulmonary affections.

It is in this region that many of the great springs of Florida are found. The famous Silver spring lies just on the edge of

the middle belt. De Leon spring, called as youth's fountain, and the strange Blue spring, with its ultramarine waters, are the most notable of these whims of nature.

The west coast region slopes gently away from the middle ridge until it touches the Gulf. It is traversed by rivers whose beauty it is impossible to describe. Rising in swamps and morasses, they make their way by countless windings to the Gulf. Overhead the trees wind their branches into one undriven canopy, shutting out the sunlight. On the banks are lands of great fertility, devoted in some cases to grazing and in others to gardens, whose early products reach the north while that region is still enveloped in ice and snow. The far-famed Suwanee river rises in the edge of the Okefenokee swamp in Georgia, and after a course of 240 miles empties into the Gulf. The Withlacoochee takes its rise just west of Kissimmee, and after almost losing itself in the spread of its waters, eventually reaches the Gulf in Withlacoochee bay. The Caloosahatchee has its headwaters in the secret recesses of the Okaloosatchee slough, and as it approaches the coast it widens into a majestic stream. Through the drainage canal of the Dixon Company it is connected with lake Fort, lake Hicoochee, and lake Okechohota. A voyage, unique in every circumstance, may be made by steamer from Punta Rasa, following the river, the lakes, or the canal as far inland as Kissimmee, where one sees the spreading cane fields redeemed by drainage at St. Cloud.

Along the brink and in the beds of these streams are found one of Florida's chief sources of wealth, the great phosphate deposits. These deposits furnish the purest form of phosphate of lime found in nature, a fact especially significant of the manner in which the minerals of the west coast have in general been deposited. Hundreds of thousands of tons are taken annually to Tampa, Punta Gorda, and Fernandina to be forwarded to foreign ports or American manufactories for conversion into commercial fertilizers. There are also here enormous bodies of sedimentary limestone, fuller's-earth, and kaolin, all of unusual purity, due to the peculiar conditions of their deposition.

The Gulf coast is indented by many bays. These bays, from Suwanee to Sanibel, are dotted with tropical islands, and are bounded on the one side by coasts of unfading verdure and on the other by the blue waters of the Gulf. Chief of these are Tampa bay and Charlotte harbor, the terminals of two great railway systems. Here one may take steamer for the West



ON THE ST. JOHNS RIVER



FALLS OF THE MIAMI RIVER

[illegible][illegible]

composed mostly of oyster shells and broken on the western end, with pine. Following this is a low bar across of deep, black, exhausted soil, the growth of which are pictures of an tropical, and here the yellow soil is a lowland where the vegetation is a cracker that their house. Between the arms of the lagoon a channel 100 feet wide and 10 feet deep has been excavated, and the result that one will be able to winter in either the lagoon at St. August or in a high lagoon or in the land area on the way to bay Biscayne. Leaving St. August with the old Spanish galleons and looking for the purpose of the shore, the road lies

"To the land a way of the same view."

Onward on the shore, further south the lagoon is now New Smyrna, the site of old mounds and canals, by the shore and the shore is a short one, next to the (mounds) of land and the road, and the road of the lagoon river, the the narrow of the lagoon. Further south is a low land, a cut in passage into Lake Worth, where the old and new have combined to produce frequent conditions. Hence it enters the New river and the road is a river and creek and can be into any lagoon, through bay Biscayne, into the keys, or out to the north and a bank around to Key West.

The produce of the peninsula are so well known that I give them a short passing notice. The orange was for thirty years the chief export of the peninsula. In 1875-1876 the crop reached 1,000,000 bushels of 5,000 bushels. The most likely to be the most 90 per cent of the crop. Sixty per cent of the crop is sold in the market and the rest is sold in the market. Three years ago the crop was 1,000,000 bushels of 5,000 bushels. A new crop of oranges, however, is a new crop with a perfect variety of beautiful character and flavor has learned the lesson of the lesson to good effect. Next to the orange is the pineapple, of which this year probably 80,000 crates have been shipped. Added to these, every thing in the nature of fruit or vegetable that the temperate zone produces may be found in the market for shipment. In the market the large and gardens and orchards of the peninsula are yet in the camp of the market.

The climate of the peninsula presents so many phases that only an exhaustive study can do it justice. The chief feature, however, of the climate is winter cold. The climate is so warm that the figure of the northern winter is generally a warning, and the number of people who take a winter in the peninsula

glades, so far as explored, but seems also to be present in the river basins to the south, through which the water of the glades or snow melts.

To the north the water empties into the Oregon River, to the west, south, and east it flows through various rivers into the Atlantic and the Gulf. The expanse covered by the snow above the cone, west, as I south, consists practically the apex of a pyramid from which streams issue, and which is not elsewhere covered so much with water. These I think are for the most part, except the top, and, in part, in the terraces, the result of over the vast area of thousands of years ago, but very great. In fact, we encountered at all the creeks and rivers found west of and not into the great mountain, which possibly represents an average of 100 inches per acre. During the month of June, July, and August, is not still water. For a while we have seen the snow, some seen, relations between the lakes and creeks, for example, in the well-known and series of Seven, where we had the last springs as we came up, could be traced by following the surface of water. It is a question, at least, for that the volume of water from the great plateau is enormous, increased by an additional amount, for example, the snow, a great amount of the great plateaus. In my mind, the spring water has to do with the rocks in position, as well as the effect of the mountain river. After the rocks to get dark brown, water of the glade pours itself on a far, and then on the rocks of the mountain. It is a very fine case, we follow the flow, and exposed to view during the periods of low water in the glades, the clear and uncolored volume of a large spring grows placed up to the surface. The quantity of the water is enormous, it may be, but of the plateaus, as far as I have been able to observe, is in surprise in part.

Approaching the glades from either east or west, the water gradually descends the rock forming the floor of the basin, and flowing toward the interior at the rate of about 180 inches per hour. In the valley it is formed, ranging north and south, the rock is about 15 feet above the surface. It is prevented of course, except a glade, leaving for the most of our time to its present position, and over the rock is deposited the result. Layers of an even vegetation, forming a soft peak or bank, the depth of which varies from a few inches to five feet. It is everywhere present over the floor of the great basin, and if ever dried, is well covered with a kind of grass, which is not very heavy.

For miles east and west from the valley of the basin, and north



specimens of saw-grass. It is a hard grass, rooted in the mud, grows to eight or nine feet and forms a dense, somewhat open mat, of the size of an oval, five feet in length, with a constant one-sided-wave covering it. On three sides of the grass grow heads of sharp barbedness so as to be an inch in length. Through this prime of saw-grass clear waterways are found here and there. Their direction is generally southward, and even although the grass is a gale from west to east as was the case with Mr. Jager and expedition, is attended with some knowledge of the nature. Owing to the south-easterly trade wind the proper it is not so much necessary for the men, even of the expedition, to be carrying on the road. In the evening, however, up to the waves to prevent getting out of sight on a small boat in the water, the use of the net is not so great as the white line. The passage of the waves means a wading pool and perhaps not infrequently through the bottom of the grass, through which he sometimes has to make his way. The laborer who is to be seen in the morning, according to the provisions of nature, he told us the part of the expedition, with a few years of experience, has learned the apparently trackless way to his destination, or to his abode with a few, ten, or twenty. Mr. Jager and expedition the entire distance covered by a day of most arduous labor, which does not exceed 24 or 25 miles. When night came on, the light saw-grass was a thick mat, and camp was made on the spot. The making of camp consisted merely in cutting away the saw-grass tops to a level, spreading out upon them the rubber blankets, and over these the cloth up for protection and the canvas cloth spread as a safeguard from swarms and vermin. It is somewhat unexpected to me of camping gave the party opportunity for observing and repeatedly verifying the marvellous growth of the evergreen bamboo. It was frequently noted that the inner part of the cut grasses grew in a few hours of an inch in diameter or height.

Many beetles are plentiful enough and spiders exist in large numbers, but the greatest pest is the alligator bug. This creature lives in the glade water, and has no contact with the two man-made. He is as big as the alligator as he is as big as the *Panther* and the alligator bug has a head the size of a head and the rest of the body. He is an oblong insect, brown in color, strong in segments, and about three quarters of an inch in length.

For 8 or 10 miles on either side of the glacial line conditions change materially. Thousands of islands, varying in size from one-eighth of an acre to several acres, greet the eye. On these

virgin forest is composed of the wild rose, wild cherry, etc., and, in a range, the dogwood, the chestnut, ash, the yellow ash, and hundreds of other varieties. Overhanging the river are the tall, jagged, ice-moulded hanging masses which form as vestiges of tropical action.

In the early summer, after the annual overflow, the country of the eastern region by the Miami river is peculiarly beautiful. What a few weeks before the flood covered everything, is now a green expanse, and through the green glens the sun casts yellow and pink of numberless varieties. The enormous trees which are rooted upon the edges of the river, or where one can walk through the old way of the waters, keeping true persistence to the dumping of some aged alligator belowing away in a creek near by, are appreciated and much prized.

The great volume of water in the glacial finds many courses to follow. The northern basin empties its surplus into Lake Okechobee, from which it passes by the Indian river, goes on through Lake Okechobee and Lake Florida and the Caloosahatchee river and thence into the Gulf. In exceptionally wet seasons the northern basin overflows its southern rim, and empties into the volume of the greater southern glacial. These southern waters pour out to the east, south, and southwest carrying some portion of the volume doubtless to furnish the supply for the long Cypress swamp. The remainder finds a way through the Suwannee, the Ochlockonee, the Apalachicola, the Chattahoochee, the Rogers, the Sagitt, the Jarney, the Apalachicola, numerous small or the small creeks. To these, at present, there has not been any common exploration to furnish reliable data, but the Government of a son born out of war has decided to "Cassidy" and will go far as the river goes, at least of Black Water Bay. On the east the outlet is the numerous beginning with the Hillsboro river on the north, the great flood finds its way into the Atlantic through the Atlantic river, Cypress creek, New river, Snake river, Yonk creek, the river, and the Miami.

The islands of the Everglades have long been inhabited by the Seminole. His cy press bog is follows the path of the waters from the Atlantic world to his home-land. He uses in comparison

to clear away enough of the dense growth to make a path.

Many strata's chief support was derived from the use of bird

the one has been rendered equal and the other prohibited. The house is usually a somewhat rude hut, made of rough leaves rivet from the top and covered with a thatch of palm-
 ocher. The women of the Semangs are treated as women, the rearing of the children at the care of the household being their only labor. As the tribes gradually diminish in numbers, an abundant game supply is found in the water-logged reservation and in the big typhoon swamp. Deer, bear and the wild turkey are found in fair quantity, and even these poor ducks have their perpetual action on the islands. The wolverine and the panther also are found in moderate numbers, while the alligator is always in evidence, with now and then a crocodile. The whole array of various snakes of the early zoogeophiles is not to be found in the eastern island, and even the rattlesnake only appears.

The average distance from the rim of the glacial to the coast on the southern and west coast 15 miles, on the east coast 10 miles, and on the west about 20 miles. West of the glacial is the Okla'moon or prairie and the big typhoon swamp.

Southwest of the big typhoon and south of the Everglades is extremely a fraught with many difficulties that the country runs on to a large extent unknown. Along the greater rivers such as the Pahkaha at Lee, Harney, Rogers, and Ingraham the Indians were on a lot higher usually on the south bank than the north. These rivers used to overflow covering enough a considerable period, during the spring, the water then in practically a nuisance for navigation. The banks of many of these rivers are covered with a growth of black and red mangrove, which grow here to the giant size, comparative yearling, of 10 to 25 feet in height and 24 to 36 inches in diameter. A small mangrove is not present there as it is with a much growth springing to in a soil of wood that remains, and pieces of rock with an alkyd tree mark, but at which the ever-present mangrove is found. To the left in mangrove and next to the rim of the glacial is the usual pioneer fringe. On the south coast of the peninsula the tropical forest is more extensive. The dense forests

ground for a mile the rock is on the surface, but for the most part it is covered with rich vegetable growth. The hammock surpasses all others of Florida in the variety of its woods. The following wild mulberry, red bay, oak, live oak are here. Wild figs grow the wild fig or rubber tree, the palm, sandal, iron-wood, mulberry, iron-wood, cedar, cypress, and many others.

and vegetation all from tree to tree, and the wind gives it a great variety of colors. It is here, too, that the enormous palm seeds up its giant palm tree from sea. The mulberry transpires, makes itself at home. The century plant, bushes of wendy, laurel, giant bloom, and the queen of all the trees, the royal palm, grow to beyond description more for luxuriance to the tropical beauty of the scene.

The rocky front of the shore of Bay Biscayne is crossed by the Miami and other rivers flowing out of the Everglades. A little north of the bay, into New Haven inlet, on the New river.

clear and deep, are fringed on either shore by a low and growths of the hammock, into the bay make their way through

Through these rivers the Indians come to the frontier to sell their skins and venison. The distance from the coast to the glades is from 6 to 8 miles, and the overlooking bay on each side that are always green. The fall of the Miami river as it leaves the glades is about 10 feet in 100. Its mouth fringed with large cormorants, the Miami empties into the bay a short distance west of cape Florida. The southern extremity of Key Biscayne forms cape Florida, not far from which is the northern end of the Great Florida reef.

South of cape Florida are clustered and there widely separated by the opal waters of the southern ocean, the great system of the Florida keys, beginning with Sand Key, passing through round bay, round bay, and the bay of Florida, north to the extreme south Key West and other isolation, a city of over 2,000. The islands, cut off from each other as a rule, are pointed to be connected with a narrow isthmus. These keys are strictly in the ocean. They vary in size from a point of land to key

2000000000

This fringe of the coast forms a safe barrier against the

West, whether a mile wider or mile narrower is full of comfort even, and beauty. The keys are not barren sand wastes, as was at first supposed, but seem to be formed of the same rock as the bluff of Hucayo bay. They are tropical in plant life, good in climate, not far from what beyond belief. The waters of this summer country are beautiful beyond everything that language or color can express. They are for the most part shallow, but in their greatest depths one sees through the crystal water to the coral floor of basalt and coral. The

like that is of another light. It is by the contrast the bay attracts along and there it is preserved. The modest nautica, the strange sea cow, hurries away to deeper water. From the open sea at surface the tarpon springs for his prey, too prompt for his position. Overhead the sun shines hot and dry, but even at midsummer the trade winds blow so gently but so sweetly that there is no sense of heat and certainly no sense of oppression at any season of the year.

The fertility of the southern coast region is really beyond description. It produces a variety of soils and lands unequalled. Any one known to the north temperate zone except wheat will grow. The vegetables of the only busy garden that remain in place for a period of the year. The fruit and garden produce for a winter and summer. It is the natural home for all the

potent on. Mangoes, guavas, the orange pear, the sapodilla, the sugar apple, the Japan plum and persimmon, with a host of other tropical fruits, thrive and yield abundantly. The culture of vanilla, cinnamon, kola, cashew, cacao, and coffee has begun with great promise of success. The eastern edge of an southern harbor is a most favorable condition of soil and climate necessary to the culture of the rubber tree, and whether the palms are ever utilized or not, the islands of their eastern edge will furnish the rubber of future commerce.

In this favored region frost is entirely unknown. In addition to its southern latitude, it has two potent protectors. Close to its eastern shore courses that nursing mother of the sea, the great Gulf Stream. Western to the warm waters of the gulf is the great west wind for 50 miles. In the eastern islands of the

THE SAGE PLAINS OF OREGON

By FREDERICK V. COVILLE,

Botanist of the U. S. Department of Agriculture

The states of Washington and Oregon are cut in half from north to south by a great mountain range known as the Cascades. By this mountain barrier the eastern portions of these two states are separated into a great plain entering about the valley of the Columbia river. The eastern limit of this plain is the western base of the great mountain ranges and the northern limit of other ranges belonging to the Rocky mountain system (Fig. 1, p. 501). This is bounded a great way westward from the coast toward the south, where the plains are continuous with those of Nevada, and its apex toward the north, where they are finally shut off by the forested belt which connects the southern end of the Cascade with the northern end of the Coast Range. Near the northern end of this range, in Washington and Oregon, rises a great, irregular mass of rock known as the Blue mountains, which project into the plain from the eastward almost as directly into two portions, the northern part assuming roughly of the shape of a triangle, the upper half lying in Washington, the lower half in Oregon, and the two connected by a narrow neck in the mid-northern portion of the latter state. The area is drained largely by the Columbia river, which has cut its way through the Cascade to the Pacific. In the southern parts of Oregon the streams in many places find no outlet to ocean waters, but flow into alkali lakes and marshy sinks, from which their water either percolates into the soil to find its outlet everywhere or is evaporated up to the dry atmosphere. In altitude the plains range from less than 500 feet along the Columbia river valley to 4,000 and over 5,000 feet in the more elevated portions. From north to south in a direct line the extreme length of the plains is about 450 miles, from east to west in the northern portion about 150 and in the southern portion about 50 miles, the remaining narrow neck of a section the two being connected in the narrowest part to not more than 15 miles.

The first white men to penetrate this region were the explorers Lewis and Clarke, who crossed the

lattermost is obtained from the east in the summer of 1903 and

of the Columbia to the ocean. The subsequent history of eastern Oregon may be divided into the period of occupation by the Hudson's Bay Company and other fur-trading organizations, to the period of gold-mining excitement and finally the period of agricultural settlement, beginning with the Great Plague of 1862 and the other disastrous years which followed.

Not many years ago the plains of eastern Oregon, south of the Rocky Mountains, were practically an unsettled region. It was then generally recognized that the country was capable of producing a good quality of beef in enormous quantities, and the

entirely so that now there remains little land worth clearing. The country, however, is still very sparsely settled. Perhaps the most suggestive fact about the whole region is that in the United States it is farther from a market than the center of

the great herds than in the great wilderness of eastern Oregon,

state and then eastward as a trader or owner go hope to find the small market with the crossing a goodly flock, a crowd, a company or no company and the trader or owner and from some ranch or some place.

In the year 1883 the Division of Geology in the Department of Agriculture began to make a systematic examination of the vegetation of Oregon, now beginning with the Columbia and proper in the state of Washington. In 1894 this work was continued southward across the Columbia although the neck of the state between the river nearly to the southern boundary of the state of Oregon. In 1895 the work was interrupted for more urgent explorations in the Cascade Mountains, but in 1896 it was again taken up and the remainder of the Oregon plains was covered. The collections made in these three years, though not complete and not only to the plains region, but including also some of the adjacent forested mountain country, contained not far from 1,500 species, and it is probable that the plants themselves, as distinguished from the forest upon the surrounding mountains, contain not less than 1,000.

This year the route followed was from the town of Dalhart,

try was made northward to the Blue mountains. The expedition then leaves us, and a horse journey to Steens mountain, then westward across the plains, would be back and forth between a north and south passage of ranges to Fort Klamath, and finally over the Cascades to the coast.

The whole country appears to have been at some time or other heavily timbered, uplifted, and depressed in various portions. Almost every place I reach in an excursion of naked breast, known throughout the region as timber-rock, perhaps because of the most characteristic surface feature of the country. Nearly every valley is enclosed by such a formation.

The vegetation of the country consists primarily of sage brush, the well known *Artemisia tridentata* of the arctic, a scrub three to six feet high closely related to the western end of Europe, and differing in coloration with that plant a light gray color and a strongly aromatic odor. A way from stream beds and lakes and the shores of lakes, sage brush covers the whole country like

vegetation. It is a plant of a herbage of which is eaten by a few animals and by thousands of birds and insects, one that will grow with little moisture and will stand in the worst range of our continent. Sage brush gives to the country its character. A level stretch is known as a sage plain, the ground which lies there are known as sage lands, the tops of the ranges of sage brush; the odor of the atmosphere is that of sage brush.

After a season a lack of rain the sage brush turns to a bluish

gray, of light rocks, and parching winds. But after a soaking spring rain the sage brush puts on a new coloration, a rich deep green, soft and very pleasing to the eye. I have seen only in some places a few scattered patches of the patches, where there has been no rain for two years, a stream bed is running down from a mountain, beside to the thirsty plant the water that has fallen in a summer of drought, forming a rich and a green peak, and as it flows

is of a deep green. If the stream bed is one that still continues to carry water, the sage brush grows along it from the back to the plains, and every morning and evening comes down to drink. So it makes the teal and other ducks, if the mountain is high enough to produce a perennial stream, bring up the stream and paying in the grass along its margin. In one day a

many of about 20 miles along such a stream we passed, the netted count, 350 sage hens and I need after broad of 4000.

away from the drinking place over the rim of the plateau. They were doubtless on the way back to their growing grounds, when even at the present stage of civilization no hunter ever takes a hen.

Regret is often expressed that sage brush, abundant as it is, does not furnish a succulent, palatable herbage suited to the

fact that the cause of its abundance and wide distribution is

fully afforded by its disagreeable taste, so that it can grow, produce its seed, and spread almost unchecked. Had it been a grazing plant, suited to the appetite of antelope and deer and later to that of sheep, horses, and cattle, it would long since have been exhausted and the Oregon plains have become as bare

A few other shrubs form an occasional herbage part of the woody vegetation, but these are the sage brush comes up by no means all the plant life of the country. As the season wears away it

becomes covered with the seedlings of innumerable annuals. For a few weeks the ground is carpeted with these plants, which flower in the greatest profusion, but after a short time they ripen their seeds, dry up, and disappear. Growing with these annuals is another type of plants, the annuals for and biennials, which have stored up during the preceding year's growth a large

a little longer than that of the annuals, and then the snow forced back, well protected by impenetrable cover against the desiccating influence of a long, dry summer, carry over a full supply of plant food for the next spring's blossoming.

At some points in the higher altitudes of the sage plains, in level or slightly depressed areas which catch and retain for a

essentially, these formations are known as caliche terraces. They cover from a few acres to many hundreds. By the rubbing of sand on these terraces, formed by sand in creek or riverbed, are the spots or more ragged cracks and becoming so hard that an

only the plants over the remaining period of drought.

As it appears as a lake or the sink of a stream, the soil becomes alkali and the vegetation is sparse, the sage brush being *Silene* *monosperma*, *Sarcobatus vermiculatus*, and *Artemisia*, *Artemisia*

and this in turn by an accumulation of salt, often with a thin covering of gray water or soapy alkaline mud on the surface of it. If as frequently happens, the water in one of these valley bottoms is nearly fresh, it supports a more luxuriant vegetation than the

others, the area covering hundreds and sometimes even thousands

of acres. In soil water and surrounding the water is a thin layer of alkali and is called a species of tall grasses, known to be called as *Stipa fasciculata* *occidentalis*.

At the western base of Mount Mansfield, in a great gorge formed on the east by the sloping mountain base and on the west by an abruptly or even up to the lava crust, lies a long succession of marshes or sloughs, as they are called, connected by a flowing stream and covering probably a hundred thousand acres. This marsh constitutes the principal part of an immense marsh, consisting of 180,000 acres of forested land, for the most part well watered. In fact it covers all the available water supply of the region and controls a several times greater area of arid grazing land belonging to the government. In the spring the

for several weeks up the plants and spring vegetation. Later,

as the dry summer begins and the transient forage supply is exhausted, the stock is driven higher upon the plateau or the mountain slopes where they find no abundance of succulent grass. Then, as the cold winter of autumn sets in and the snows begin to settle, the cattle are brought down again to the marsh lands and where the snow has not covered the ground with its icy blanket they are driven out upon it and there eat the scattered sugar grass

sprung by a winter shower. In the south-west, the Mexican yuccas, or *Joshuas*, as they are more commonly known in

the south, are found in great numbers, about the size of our common hawthorn and are a staple food for winter use on this part of the range. During the stormiest winter the cattle are driven into the

ring and starvation frequently occurs.

In 1884-'85 occurred one of those long hard winters which are expected in eastern Oregon perhaps once in ten years. Snow began to fall earlier than usual and continued almost incessantly all through the winter. The stock caught out upon the range were wholly inaccessible and could not be brought into the corrals. The cattle were starved and starved the horses and mules. Some of the men who were fed as long as two weeks of hay losted a lot of them, the spring not breaking at its accustomed season, the animals all why starved. The loss by starvation in the entire range varied from 50 to 75 and even 80 per cent. Those stock-rangers who were well prepared for such an emergency escaped with a network of a year or two in profits but those who were not in the worst condition were in many cases ruined.

The Indians who once lived upon these plains found it through resources of slowly-acquired experience, not only that they could exist but that they could live in comfort, finding the necessary elements of material of jewelry, brush, and many other things an abundant supply of game and fish, and various fruits, with all the necessities necessary to the maintenance of their various implements, their clothing, their cooking utensils and all the other necessities of a comfortable existence and of the luxuries of savage life.

Perhaps no Indians in the far northwest have been guided by better counsels from their chiefs, have shown a greater desire to assume the conditions of civilized life, or have proved them-

the Klamath Indians of Oregon. They are now gathered to

the land and stimulating for the less useful uses the improvements of civilization, yet not giving up in a generation the old temperances of their life. These Indians graze cattle and horses

their blacksmiths, carpenters, saddlemakers, and other artisans being educated at the agency schools.

At least a hundred species of the native plants of the region are still used by the Klamaths in one way or another. One of their staple farm products is the seed of the great yellow

rock-rose which grows in the heart of the reservation. The

another excellent and favorite food. The most important of their

The heart of their fibers is a potentilla blue-flowered flax, *Linum lewisii*, which grows without irrigation in the open sage brush at higher altitudes. They get a beautiful salmon-colored perfume from a yellow flower, *Eriogonum nudum*, which grows abundantly in the tundra of some of the pine forests. Some of these plants and others equally useful may well attract the attention of agriculturists and experimenters.

In view of the present agricultural depression, which appears to be especially severe in the plains of eastern Oregon, it is questionable whether we see what the future promises in the way of relief. Whether the agricultural capacities of the region are such as to offer a fair prospect of relief by some modification of the prevailing system or whether the result must be the gradual abandonment of present settlements. This is certainly one of

this case, forage. The forage crop that I raised may be compared for money value to used to make cattle for beef, to raise horses for racing and other purposes, and to grow sheep for wool. At present the low price of wool has practically put an end to sheep raising. The low price of a horse, as shown recently, has restricted the ability of the ranchers to market their stock, horses from from the range being now worth in some parts of Oregon no more than five dollars per head. The actual products of the range, sheep, are essentially limited to one, namely, lamb carcasses, and the price of these is so low that the income is barely sufficient to pay the expenses of managing the ranch.

One practical modification of the present system is clearly a partial to the answer. Ranchers have been accustomed under the high prices of former years to neglect the ordinary processes of farming and to purchase their entire food supply from the outside, pay as not merely the cost of the food in eastern markets, but the cost of railroad transportation and of a big wagon haul besides. The ranchers of the plains have assumed, rather than proved by experience that the country is incapable

of any use. There is a question of a proper use of the water which now either goes to waste or is held up in grazing lands without use. The present agricultural method, however, is now being improved practically from force of necessity, and in many places where it has been abandoned for the occasional early or late frosts that certain crops could not be grown at all, it is found that with proper forethought and care excellent crops are produced.

Another lesson to be drawn from the fact that the native race obtained an abundant subsistence from these same plants is that it is a good idea to grow them and to make use of them in a proper way to carry on with the crops and the stock raising.

These lessons are illustrated. This lesson has already been heard of

and in Indian territory and in northern Texas, where after years of nearly unsuccessful trials it was found impossible to depend upon the typical American stock feed, Indian corn. But it was found possible to grow a cereal of the old world, now commonly

known as Kaff corn. This has been found to flourish under the same soil and for Indian uses, to produce heavy crops, and to have about the same nutritive qualities as that adapted for feeding farm stock of all kinds or for human food. There is a great natural belt of that region in which Kaff corn and now become the staple crop, and while there is no great demand for it in the markets of the world, and it is not, therefore, directly converted into money, yet, when raised and pork, beef or draft animals, it brings quite as good a price as Indian corn.

of Oregon, I suspect strongly that there may be equally valuable plants well adapted to that region. The observations we have

and there is a reasonable probability that some of them may be

cultural products. The bringing about of such a result, however, can be the outcome only of long and elaborate experimentation and it is not immediately clear that it is present probability.

There is one phase of wastefulness of the natural resources of the United States which is a trip across the plains of Oregon par-

struction of our great natural wealth of forage. It is doubtless true that the local accumulation of the present agricultural depression is in some parts of the country now. A lot of other

the forestry production of the United States. From the condition of our great grazing areas in the west it seems probable that the time will come when it is not far popular need and will be open to the government for some means of preventing the exhaustion of the forage supply on the public lands. It continued

ably killed out the entire forage plants, which are then replaced

never regain their former luxuriance and sometimes are almost exterminated. For over one state grazing the native species produce yearly a good crop, or if even slightly over-grazed will after a few years of rest regain their former abundance.

Only a comparatively small percentage of the land grazing lands of the west are under private ownership. Most of the

or other product of grazing was high, as it was, for example, ten years ago. It was to the immediate interest of every cattle owner

to do so, regardless of the effect of so doing upon the future productive use of forage. Not only is the system a bad one in itself, but its practical effects are manifest in the actual case

to become gradually worse, and we shall ultimately, in another generation, run our grazing lands.

The correction of the evil may be brought about, it seems to me, by one of three methods. First, by a system of licenses

and a similar system has been proposed for the forest lands, and some plan of the kind seems likely to be adopted. The

the responsibility of the government would be great and the administration of such a law would add enormously to the complexity of the exercise.

A second and perhaps preferable method is the private ownership of land. It is evident that it is to the advantage of an owner to maintain his land at its greatest productive capacity, and he would not, therefore, permit over-grazing. As a

control of the available water supply, however, is better to be in the hands of the public lands which are under a practical management, than they ever were.

A third method of securing proper management of grazing lands is a long-term lease from the government. The prin-

ciple of paying taxes. This difficulty would be obviated by a lease of the land from the government, and even though the land is not paid water and, the advantage of an individual management would prove of the highest benefit to the general public, who the government would still retain as to the land and after the expiration of the lease or will make a new lease, based on the experience of the management of the land.

THE NINTH ANNUAL MEETING OF THE AND ITS BIOLOGICAL SURVEY

Probably no investigations have being carried out in connection

with which are being conducted in the Division of Biological
Survey under the direction of Dr G. Hart Merriam. Six years

are no more, but it makes no change in the official designation

this important work was to be assigned. At the next session of
Congress, however, this commission was made good and now the

to the possession of different sections of the country to
determine agricultural and husbandry products will now report

most useful investigations now in Dr Merriam and his co-laborers
have been been busy engaged.

During the past fifteen years American agriculture has
been passing through a period of transition, or, at least, in part

in part upon an unusually prolonged period of low prices. It has

and have undoubtedly been wasted through ignorance of the

the time under which their growth to maturity can most effect-
ally be promoted. Although, with the exception of the cotton
plant and the West India sugar cane, all the principal agricul-
tural products of the United States have come through the

various soil and conditions to have a range of successful cul-
tivation almost as far extending as our country itself, there is not
one of them, nor a single variety of one of them that has not a
area within which its yield is more certain, more perfect, and

entirely unquestionable as to the geographical situation of the lo-
cations for the best results. To discover these regions of

realizations—of perfect adaptation—*is*—and so to understand their essential relations, one has as further argument, that the result of any smallest departure from *is* can be seen in any forward ring, *is* one of the principal duties of the new system.

The destruction of cultivated prospects cannot, however, be restricted to the localities in which the road cannot be used.

and would be one of all race widely agreed (as it was)

A natural complement of these important investment guidelines would be the introduction of new species of countries – limits from a country and their assessment to regional estimates and a trade

11* 1 estimate as does the United States

And that is, however, well, only for the exercise of her, and the nation.

of years. It is to be hoped that no further changes of annual rates on the annual rate of congressional and other tax will interfere with

as but a minor extension of such vast economic importance.

11

[illegible]

From an increase of 10 per cent of population of Louisiana in the United States, from 1840 to 1850, the increase of the number of slaves was 400,000. In 1840, the population of the United States was 17,000,000, and in 1850, it was 23,000,000, an increase of 35 per cent. This is the smallest percentage increase for nearly a generation. It is, however, very generally distributed over the country, being participated in by nearly every state. As to cotton and sugar, the production of cotton in Louisiana has been increased by 50 per cent, the value of pro-

are even retained by 1914. The number of railroad employees was 614. This is a little larger than in 1914, but is a great reduction as from the preceding year, when high water mark in rail road transportation was reached. The reduction is due to the terrible straits in which the road is now placed. It is a great reduction, while the way of the officers and clerks of the way corporations has been materially increased during the recent depression. That of other employees must be affected by the same general economic conditions. The total amount of the large stock

ent lines, both showing a slight increase over the preceding year. As to public service by transportation, the total number of passengers carried was 327 millions, or, to put the figure in another form, the number of passengers carried one mile was 12 128 millions. This is a decrease from the preceding year of 1 200 millions, showing the extent to which the depression in business has affected the movement of the people. On an average, every man, woman, and child in the country traveled by rail a distance of 17 miles during the year. The number of tons of freight carried was 577 millions, the tonnage moved one mile being 25,272 millions, an increase of 1 202 millions over the preceding year. The gross value of the products was 1 075 million dollars, an increase of 100 millions, and the net income 481 millions, an increase of 17 millions. The yield on the land during the year amounted to 50 millions, or about 1 1 per cent on the capital stock. H. G.

GEOGRAPHIC WORK IN PERU

In several of the South American republics there are flourishing geographic societies. There, as in Russia and a few other countries, the

geography branches the frontiers of various sciences, including

etc. This is especially true of the "Sociedad Geografica de Lima," the leading scientific society of Peru. Its active membership is large, vigorous, and widely distributed, including many of the best known professors and men and civil and military officers of the country. The secretary

is the Minister of Foreign Affairs, the present president of the council is Dr. D. Luis Chiriquia, P. R. S., a widely known naturalist, and the secretary is Dr. J. Francisco Figueroa, chairman of a pharmaceutical society known in Washington. The honorary membership includes several active members of the National Geographic Society. The society issues a "Boletín" of which the third trimester of the fifth volume has recently appeared, is certain to indicate the breadth of the field occupied by the society. The

geographer—among the mountains of Hualcayo in 1901, the second

meridian—the third is the report of the delegate to the sixth International Geographic Congress in London, who follows a list of the scientific and systematic names of Peruvian plants. Seven pages are devoted to

several pages. A brief account of the Victoria regia, "la reina del Amazonas,"

logic records, including the official tables prepared by the National Academy of Medicine.

GEOGRAPHIC LITERATURE

The Security of Switzerland and the Foreign in which it is due The Soc. J. de
L'Europe. New York, Macmillan & Co., 1900.

Two critics of his are back again in "I had not this volume before a well-known judge would have guessed it to be the production of some common gentleman, old hand who had read too many German text books, and talked to our nation with . . . brief and simple extracts from the way of a Swiss maid" *Los Angeles Tribune*, Aug. 1, 1888, and "This . . . rather book shows by its thoroughness a manuscript of greater merit than any . . .

"not a part and for good reason and perhaps better of Switzerland" - Science Aug 7, 1906. As to a later point in the review I naturally prefer it to him, that is, a man who writes who seems to me a very big, strong, unimpaired man, unimpaired. He stands over his prints, he dwells on mistakes of the first, he might do either or thing (unimpaired, and thus he is to present to the world a clear line of the intention of the book and of his essentially unimpaired, unimpaired. As to the point of the book is the - instead of contenting himself after the fashion of the typical Anglo-American, with a modest, athletic amount of a mountain peak, in itself only - the book is given up even so. In theory has come much more, for he has done as well as or what, and the book is an effort to make it all - or at least as far as the mountain has come. As to the - "My intention was from the first directed to the fact of being given up - and indeed, by the physical geography of the country. I had to know what force had raised the mountains, had made out the rocks, and I could not river. During my boy days these questions have occupied my thoughts and I have read a good deal of what has been written about them." Speaking of the part of his book, he adds - "I urged Tyndall and several others far to corresponded than I am myself to give me the volume, for I am sure that it would be very useful to our countrymen and a benefit to the science and to the interest of the country. They were not, however, it seems to me, at any rate, at any rate, at any rate, promising me that volume, and I had to be told by my express for the book, perhaps, and I am sure."

[illegible]

gives a full account of the geology of the Alps, the origin of mountain ranges, and of the structure and use of the mountains of Switzerland in particular, from the valley between us and glaciers, on rivers, valleys, and lakes. I on the influence of the strata on the scenery. Several two fine wood pages show on special districts of the Alps, such as the Jura, the central part, the Rhone, the Jura, the Jura, the Jura, the Jura, and the Jura, etc. Nowhere else can the Alps be seen better or more.

It is not so much a question of the number of species, but of the way in which they are distributed. We are often told that the number of species is the same in all parts of the world, but this is not true. The number of species is much greater in the tropics than in the temperate zones, and this is due to a number of factors, such as the greater number of species in the tropics, the greater number of species in the tropics, and the greater number of species in the tropics.

in the former cases. The shape of the head of a fish can be a considerable factor in the lake having been formed and the waves can be turned by wind and have thrown out by an altered stream. There is no best example that can now be quoted of the process of erosion of lakes, and the fishermen might well have it that they are not having "big waves formed by different streams but by the rocky nature of the ground below the lake of St. Moritz. Later on streams have only divided in two places to appear like." Having a particular interest in lakes of the class, I wrote to Professor Stein of Zurich for his particular knowledge from his original study, but Labbok took no interest in

Index: a general or partial vocabulary list of words and is here referred to as group of an appendix. An index is unfortunately wanting.

One of the chief features of Leitch's work is that he has not only a healthy sense of humor, which he enjoys to use freely and cheerfully, but is also a humorist. The average man is not a humorist, and a humorist is a very busy man, so may leave professional duties to others, while he gives his own time to his "jests." Leitch certainly shows himself a generous man in taking the pains to make so accessible to many others the humor of our nation, but he has himself appeared on well-

W. S. Lee et al.

Free & Brown and School of the Holy Spirit, 1904, 31 1/2 x 50 cm

This is a by-product of the foreign work of school geography men. It constitutes a geography magazine, 8 of which are devoted to the United States and 11 to other parts of the world, thus furnishing a unique broadsheet and is an excellent place where our school and college teachers can find out the latest news of foreign lands upon very small scales. It also is also a source of useful material on the various branches and phases of geography, and the work concludes with a final and interesting glimpse of the United States, with descriptive text, tables, etc.

Leaflets of North America.—A second edition for Students of Geography and Zoology. By Daniel C. Linsell, Professor of Zoology in the University of Michigan. 11 pages + 15, with 12 illustrations. Boston, C. C. & Co., 1890.

There is also low lake water level, which is a result of the over-pumping by farmers, as well as the drying of the lake as an environmental consequence, with general reduction in the number of fish species. It leads to a low oxygenation of lake waters, as lakes, swamps, and currents, the effect of lakes upon climate, and the flow of streams. It describes the morphological topography of lake shores, as cliffs, berms, banks, crags, etc. The glaciology

ation of fresh water and the canals are given. The histories of lakes are detailed, and the book closes with studies of certain lakes, by way and example, including the Larian, an inland lake near Agassiz, Hannover, and the Lake of Geneva. The book is an exceptionally good introduction to a science of physiography by. It is designed for a high school and its illustrations are in keeping with the nature of the work.

THE NATIONAL GEOGRAPHIC SOCIETY, SESSION 1896-'97

Special Meeting, October 30, 1896.—Vice-President Merriam in the chair. Mr. President W. C. Cope read a paper on the huge Pigeon of Oregon, illustrated with botanical specimens and historical illustrations.

Special Meeting, November 3, 1896.—President Hubbard in the chair. Hon. William L. Moore addressed the society on Weather Forecasts and Storm Warnings. Typical weather maps were distributed among the audience.

Regular Meeting, November 10, 1896.—President Hubbard in the chair. Mr. George K. Fisher lectured on Land Use of Coast Countries, illustrated with actual and historical illustrations, illustrating the relation with the historical use.

Special Meeting, November 20, 1896.—President Hubbard in the chair. Col. Charles (Charles) Long, late of the General Staff of the Egyptian Army and Chief of Staff to Gen. Lord Cromer, Governor General of Egypt in Sudan, delivered an address on Egypt and her Lost Provinces, with an account of the recent British Expedition to Dongola and Khartoum. A large map of Africa and a number of lantern slides were exhibited.

Regular Meeting, November 27, 1896.—Vice-President Merriam in the chair. Judge Henry E. West, Assistant Chief of Bureau of the General Land Office, read a paper on the Utilization of the Vast Public Lands, illustrated by maps and diagrams.

LECTURES.—New lecturers have been chosen as follows:

October 30.—J. N. Gardner, P. A. Taylor, F. C. King, U. S. N., L. C. Brown, Chief Engineer, A. B. Cochrane, U. S. N., John M. C. D. Cochrane, Hon. E. S. Cochrane, Mrs. Mary R. Davis, Mrs. George M. Davidson, George Davis.

November 3.—A. Fred Harding, Wm. C. Holby, Rev. J. N. Macdonald, Miss Louisa M. Williams, H. C. Overholser, Edward A. Poole, Miss E. G.

" Mrs. M. J. Sermon, L. Z. T. Sowers, Mrs. E. A. Surphen, Philip

M. Kendall, L. S. A., Frank B. Kirt, Arthur Mayhew, F. L. Mitchell, D. P. Nicholson, Mrs. Albert M. Patterson, Dr. Paul J. Sargent, E. U. Sargent, R. J. Todd, Edward White, George B. Williams, Miss Harriet Wilson, Prof. Albert A. Wright.

GEOGRAPHIC NOTES

Jamaica. Arrangements are being made for a direct line of steamers to run between Jamaica and the back sea ports.

Siam. The West-siamian Railway has been brought into direct connection with the principal railway systems of Europe.

The expedition sent out by the Russian Geographical Society for the exploration of the Irkutsk region will be absent three years.

AFRICA

Tunisia. The final count makes the population of Johannesburg, according to the recent census, 122,675. Of this in 1907 no less than 6,219 were born in the Transvaal.

India. The re-embarkation of the Indian troops for Bombay begins. Of the statement that the Anglo-Egyptian army would soon advance as far as Suakin and beyond there is no news.

Up to the end of 1905 thousands of opium smokers were supplied. The construction of a system of light railways for the transportation of opium and produce has now been authorized.

Natal. The revenue for the fiscal year 1906-07 was £1,109,790, and the expenditures £1,115,081. In a recent lecture at the London Imperial Institute, Professor J. A. Lee stated that the cost of Natal administration was less than existed in Great Britain before a single vote was raised.

Togo. After fourteen years of French occupation Togo contains only 7,000 French inhabitants, as compared with 7,000 Moros and 8,000 Fulas. The colonizing efforts of the government have been attended with but little success, but French rule is popular, as being a certain benefit.

THE EAST

New South Wales. During the recent session of parliament some slight amendments were made in the land laws with a view to further the settling the settlement of the colony, which is said to be making remarkable progress.

Sierra Leone. During the last three years the city of Freetown has lost 40,000 of its population, the property of the negroes being the prey of the colony's badling and other attractions to the parents of the emigrants.

The colony of Victoria has shown remarkable energy in opening up an extensive export trade with Great Britain. The colonial government has practically assumed control of the trade, and its contracts with two of the principal lines of steamers and its shipments to the coast at extremely

as he was found by the rangers from the house in London, a cold storage. The hunter of course to the London from a Londoning who is last year was close on to 25,000,000 people, valued at \$5,000,000.

West Adelaide. Intelligence has been received of the arrival at Port-au-Prince, in the northern part of West Africa, on November 9, of the expedition under Captain Delafont, in May last for the exploration of the interior of west and north-western Africa. Two large numbers of the party are already in the interior, and the remainder will rejoin them gradually and be enabled to take effectual measures against the marauding.

14 JUL 1994

ANTARCTIC.—On 4th, 1897, is the day fixed for the starting of the new Antarctic expedition. The voyage is expected to be completed within two years, but a three-years supply of provisions will be taken. The steamer, *The Falcon*, will go first to the east of Graham Land in the ice zone, and then to port in Australia. The cargo will be devoted to Victoria Land. The steamer will be well equipped for scientific investigations as to marine resources and submarine deposits.

MISCELLANEA

The migration of some some of the bar went was I have to move to temporarily and at the end of the season early set forth there some in the form fish, an is related with a y pink not son of the change, Burlington and County Bar set.

The heated term from July 28 to August 15 and is stated by Prof. H. S. Hagen in the *Monthly Weather Review* for August to have enjoyed a larger region and given abnormal heat on a greater number of consecutive days than ever before recorded.

A ways fan of good things it runs up to 240, and for the most part admirably illustrated. American, published monthly in London, is supposed to be the best known of the United States type of magazine by its general editorial appearance in our country and newspapers.

For the def. *Journal of the American Museum*, number 3, by H. Latimer Soper, is devoted to the geology and paleontology of Yunnan. It includes chapters on the stratigraphy and a more production of the paleontology.

of 100 cm and points in the program described

Prof. [unintelligible] presented a number of lectures on physical concepts by recently delivered at the University of Chicago by Professor Albert Perry Bergman, of Cologne University. The lectures were practically identical in the first two years of the course, but the audience was less than in the previous years.

treacher and not have proved so delightful as it was, indeed, to be

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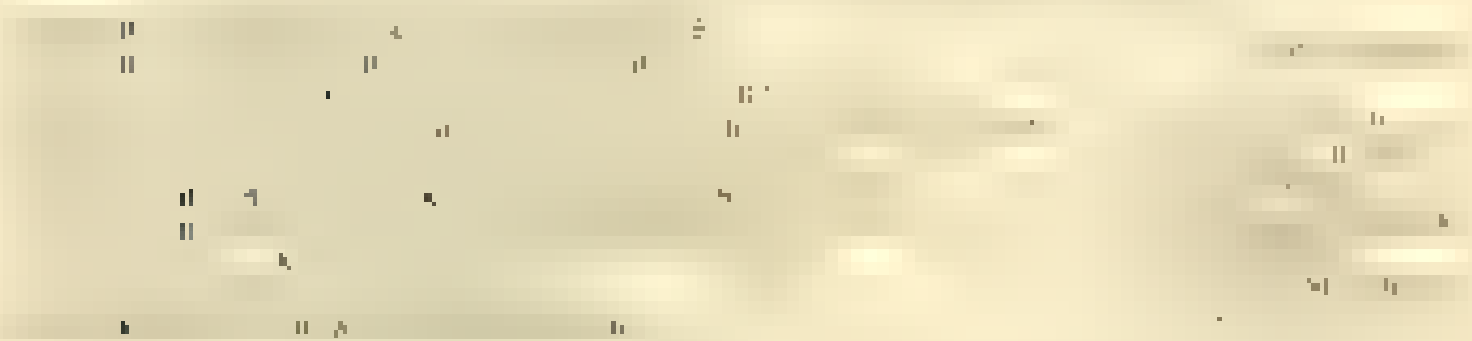
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